

SYNTAX

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PERSONAL COMPUTERS

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HOW TO BUY A TIMEX COMPUTER

Last month we reported you could buy Timex hardware and software by mail. Timex took exception to that report. "We do not have a primary plan to sell computers by mail. The 800-24-TIMEX number provides referrals to stores," said Timex VP Dan Ross.

"We will arrange to service you (customers) by mail--but only after we have directed you to retail outlets and they have been unable to fill your needs," Ross later clarified. "We are cleaning up our 800-number list now to make accurate retail referrals."

"Our primary thrust is to support retail distribution of Timex Sinclair computers," he concluded.

1500S ON THEIR WAY, 2068S CLOSE BEHIND

Our Timex source says a few TS1500s began their way to your local stores the first week of September. The FCC approved the TS2068 recently; expect it in stores by October.

You can order TS2068s now through Sears' Christmas catalog--\$179.99 less 10% if you order before 18 Oct. Cat. #3 E 23022C.

TIMEX SINCLAIR CELEBRATION IN BOSTON

To commemorate their 2nd year, the Boston Computer Society's 800-member Sinclair Timex User Group will bring together TS owners, user group reps from all over and hardware, software, publication and service vendors for a day-long show and workshops.

Dan Ross of Timex and Maggie Bruzelius from Sinclair will give updates on each company. A local retailer will sell TS1000/1500 and 2068s, plus printers, RAMs, and software.

For info, call Sue Mahoney, 203/755-2699, Jack Hodgson, 617/354-7899 or BCS, 617/367-8080. \$1 to BCS members, \$2 to any UG member, \$3 general and \$5 family. Saturday, 22 Oct., 10A-6P, Boston Park Plaza Hotel.

SYNTAX ERROR: J. Brezina of Elm-hurst, IL, reports to get correct Puerto Rican and Washington, DC, zip codes in ZIP-TO-STATE...(Sept. 83), delete lines 5140 and 5150 and add the following lines. Also, delete line 5110 (a repetition).

```
5125 IF CODE Z$(X)<10 THEN LET U
$="0"+U$
5135 IF CODE Z$(X+1)<10 THEN LET
U$="0"+U$
NEW SYNTACTIC SUM: 44528, 8K ROM
```

W.C. Andrews of San Anselmo, CA, sent this correction/improvement:

```
5140 IF VAL U$<=9 THEN LET U$="0
"+STR$(CODE Z$(X))
5150 IF VAL U$<=9 THEN LET U$="0
"+STR$(CODE Z$(X+1))
5200 CLS
5210 PRINT AT 8,4;"THE ZIP CODE
RANGE FOR",TAB 13;"",X$,""
,TAB 14;"IS",TAB 7;"
",TAB 7;"",Y$;U$;"00 -- "
;Y$;U$;"99";"",TAB 7;"
5220 GOTO 580
5250 PRINT AT 8,4;"THE ZIP CODE
RANGE FOR",TAB 13;"",NY"",TAB
14;"IS",TAB 7;"
",TAB 7;"090000 -- 14999",TAB
7;"
5270 GOTO 580
5300 STOP
NEW SYNTACTIC SUM: 51129, 8K ROM
```

NEW PRODUCTS AND SERVICES

BIO-RHYTHMS program provides monthly biorhythms and summarizes your important biorhythmic days. Documentation includes theoretical background. Tape \$7.95. UAS, POB 612, Haddonfield, NJ 08033.

New ZX/TS books: The Timex Sinclair 1000 Ideabook by David Ahl, \$8.95; 50 Programs for the Timex Sinclair by Leland Carter, \$6.95. Creative Computing Press, 1 Park Ave., NYC, NY 10016, 212/725-7892.

GOLF HANDICAPPER computes, saves, updates handicaps for up to 48 players. Computes by USGA guidelines for 18-hole courses. 16K tape w/doc. \$20 check or MO to John B. Carson, Jr., 11200 Lockwood Dr. #307, Silver Spring, MD 20901.

ZX81 Text Processor, 2000-word capacity, edit in full or split-screen, 32K. Tape \$12.50, check or MO to A. Rodriguez, 1605 Penn. Ave., #204, Miami Beach, FL 33139.

DEMONSTRATION demo program for TS1000/1500, \$9.95; PRO-FILE PLUS data base, \$14.95; INTRUDER ALERT game, \$14.95, \$1.50 P&H, all 16K, new from Williamware, 1300 DePaul Wy, Virginia Beach, VA 23464.

Instant-load plug-in cartridges and replaceable ROMs for TS1000/1500s, games, finance, utilities, graphics, science programs. Also piggy-back extender, 2K machine ROMs. Blank cartridge and any ROM software \$25. Extra ROMs \$15. SASE for catalog. ROMPAK, 8206 Blackburn Ave., Los Angeles, CA 90048.

The Sinclair ZX81 by Randle Hurley covers programs, programming tips, hardware mods. \$17.95 (hardcover), 176 pp. TAB BOOKS Inc., Blue Ridge Summit, PA 17214, 717/794-2191.

1984 MICROCOMPUTER MARKET PLACE includes 3000 software publishers, distributors and publications, some ZX/TS suppliers. Dekotek, 2248 Broadway, New York, NY 10024.

TS2000 books: TS2000 Machine Language for the Absolute Beginner, TS2000 Hardware Manual, The TS2000 Collection, TS2000 Programmer's Reference Guide, (by Ian Logan). \$14.95 ea., ppbk. In November: Complete TS2000 ROM Disassembly, (by Ian Logan and Frank O'Hara), \$19.95. Melbourne House, Dept. CS, 347 Reedwood Dr., Nashville, TN 37217, MC/VISA 615/361-3738.

Intercontroller computerized control system times up to 4 electrical devices. Each outlet supplies 6A at 110V, 60 Hz. Connect up to 4 Intercontrollers to your ZX/TS. \$99.95+\$4.95 S&H. Intercomputer, Inc., 358 Chestnut Hill Ave., Boston, MA 02146, 617/738-5310.

QUICKDRIVE utility and graphics program gives MC routines with BASIC demo, including BORDER, INPUT CHECK, SPIRAL, SCROLL. Resides above RAMTOP at location 31813, \$12.95. MICRO-LOAD, POB 1095, Truth or Conseq., NM 87901.

TREE-FORTH version of FORTH on 64K EPROM chip. System \$49.95, \$2 P&H. Soft Magic Corp., 1210 W. High St., Bryan OH 43506, 419/636-4531.

Get over 40% discount on power outlet strips, surge suppressors, transient voltage suppressors. Free shipping over 12 units, COD OK. Applied Electronics Resource, 11417 Fairfax Sta. Rd., Fairfax Sta., VA 22039, 703/281-6056.

RAM-MIT holds computer, RAM; improves keyboard angle. Acrylic; predrilled holes to add on/off/reset switch with plug and jacks (RS switch #275-324, plug #274-286, jack #274-251. \$19.95. Laminar Inc., Box 12332, 1514 Fairview, Columbus, OH 43212, 614/488-5158.

Z-WRYTER word processor gives type-over corrections, works with printers using TS ROM routines. 12-page capacity with 16K RAM, usable with larger RAM. \$12.95+\$1.25 S&H, \$10 Express Mail. Robotec Inc., 59 C St., Ampoint Industrial Park, Perrysburg, OH 43551, 419/666-2410.

In November: Games for Your TS1000 by Mark Charlton and Games for Your TS 2000 by Peter Shaw. Each offers over 20 games plus hints for programmers. In stores or from Dell Publishing, POB 1000, Pine Brook, NJ 07058 (+\$0.75 each for P&H).

New programs (five 2K, six 16K) include games, checkbook balancer, graphics, math, organizers, tax and bank records, drink/food recipes, music and light displays. Prices \$9.95-\$14.95. Request free catalog. SIMULUSION, POB 894, Lemon Grove, CA 92045, 619/263-6591.

R.I.S.T. Inc. ANNOUNCES

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HOW YOU CAN MAKE YOUR COMPUTER TALK.
The PARROT newly introduced by R.I.S.T., gives the power of speech to Timex/Sinclair Computers. This simple to use plug-in speech module is capable of generating all the sounds in the English language. The combination of these sounds, in the order of your choice, will generate an unlimited vocabulary of words, phrases, and sentences as well as an array of sound effects. Piggy-back expandability allows other modules (eg. memory) to be operating with the Parrot simultaneously.

Paul Donnelly had this to say in the April issue of Syntax: "Documentation is professional..."
"Overall, R.I.S.T.'s Parrot is an excellent unit and performs up to and beyond my expectations."

PROGRAM IMPROVEMENTS

Add these lines to SPELLING WORD GAME (Aug.83) to help remember the words you enter. At the first prompt, type the words to unscramble (these remain on the screen). At the second prompt, enter your scrambled list. At the the third prompt, reenter unscrambled words.

Edward Sidorski, Susquehanna, PA

```

21 PRINT "ENTER 5 SCRAMBLED WO
RDS"
22 FOR R=1 TO 5
23 INPUT U$
24 PRINT R;"-"; U$
25 NEXT R
26 PRINT "ENTER SCRAMBLED LIST
NOW"
27 IF N=5 THEN PRINT "ENTER UN
SCRAMBLED WORD NOW"
28 CLS

```

Simplify SET RAMTOP AUTOMATICALLY (Aug.83) by deleting lines 70-210 and adding line 60:

```

60 LET A=INT (NA/256)
NEW SYNTACTIC SUM: 37852, 8K ROM

```

J. Brezina, Elmhurst, IL

D-B-H CONVERSION--8K/16K

Convert decimal, binary and hexadecimal numbers easily with this well prompted utility.

Type in the program and RUN or GOTO 500. Press D, B or H as prompted, depending on the number you wish to convert. Enter numbers imitating the style as prompted. For example, you must enter binary numbers with 16 digits in groups of four. Your screen looks like this after you ENTER a number.

```
A15      8 7      0
B = 0100 1111 1110 1000
H =      4      F      E      8
D = 256 *79 +      232      =20456
```

ENTER D,H OR B FOR NEXT NO.
ENTER "S" TO STOP, "C" TO COPY

Four labeled lines appear; A defines the address bits of a 16-bit bus. B expresses the binary value, grouped in 4-bit clusters. H gives the translation of each cluster to its hex equivalent. D shows the translation to decimal, by byte (two clusters) and the decimal sum. When you press S to stop, you see report code 9/line #. SAVE with GOTO 900; the program then auto-RUNS when you LOAD. RUN 500 to start again. Press C to copy the screen display; this will not interrupt program execution.

Kenneth Sell, Long Island City, NY

```
15 LET B=32768
20 LET A=VAL C#
25 FOR I=1 TO 16
30 IF I=5 OR I=10 OR I=15 THEN
NEXT I
35 LET C=INT (A/B)
40 LET D$(1,I)=STR$ C
45 IF A>B THEN LET A=A-B
50 LET B=B/2
55 NEXT I
60 RETURN
210 LET B=4096
215 LET C=VAL C#
220 FOR J=1 TO 4
225 LET A=INT (C/B)
230 IF A<10 THEN LET B$(1,J)=ST
R# A
235 IF A>9 THEN LET B$(1,J)=CHR
# (A+28)
240 LET C=C-A*B
245 LET B=B/16
250 NEXT J
255 RETURN
```

```
300 LET A=10
305 LET B=11
310 LET C=12
315 LET D=13
320 LET E=14
325 LET F=15
330 LET AA=VAL B$(1,4)*1+VAL B$(
(1,3)*16+VAL B$(1,2)*256+VAL B$(
1,1)*4096
335 LET C#=STR$ AA
340 RETURN
400 LET B=0
405 LET A=1
410 FOR I=19 TO 1 STEP -1
415 IF I=15 OR I=10 OR I=5 THEN
NEXT I
420 LET B=B+A*VAL D$(1,I)
425 LET A=A*2
430 NEXT I
435 LET C#=STR$ B
440 RETURN
500 DIM D$(1,10)
501 DIM B$(1,4)
505 PRINT AT 10,4;"ENTER H FOR
HEXADECIMAL"
510 PRINT AT 11,10;"D FOR DECIM
AL"
515 PRINT AT 12,10;"B FOR BINAR
Y"
520 INPUT A#
525 IF A#="H" THEN GOTO 545
530 IF A#="D" THEN GOTO 580
535 IF A#="B" THEN GOTO 610
540 GOTO 520
545 CLS
550 PRINT AT 20,0;"ENTER HEX NO
""0000""
555 INPUT Q#
556 IF LEN Q#(>)4 THEN GOTO 555
560 LET B$(1)=Q#
561 FOR I=1 TO 4
562 IF CODE B$(1,I)>43 OR CODE
B$(1,I)<28 THEN GOTO 555
563 NEXT I
564 FAST
565 GOSUB 300
570 GOSUB 15
575 GOTO 700
580 CLS
585 PRINT AT 20,0;"ENTER DECIMA
L NO.
""0 TO 65535
590 INPUT C#
591 IF VAL C#>65535 THEN GOTO 5
85
592 FAST
595 GOSUB 210
600 GOSUB 15
605 GOTO 700
610 CLS
615 PRINT AT 20,0;"ENTER BINARY
NO. ""1 OR 0""
620 INPUT Z#
621 IF LEN Z#(>)19 THEN GOTO 615
622 LET D$(1)=Z#
623 FAST
625 GOSUB 400
630 GOSUB 210
700 SLOW
705 PRINT AT 20,0;" A15      8
7      0
      B = ";D$(1);"
710 SCROLL
```

```

715 SCROLL
720 PRINT AT 20,0;"H= ";B$(1
1)" ";B$(1,2)" ";B$(1,3
);B$(1,4)
725 SCROLL
730 PRINT AT 20,0;"D= 256 *";IN
T (VAL C#/256);AT 20,12;"+"
AL C#-256*INT (VAL C#/256);AT 20
22;"=";VAL C#
735 SCROLL
740 SCROLL
745 PRINT AT 20,0;"ENTER D,H OR
B FOR NEXT NO. ENTER ""S""
TO STOP, ""C"" TO COPY"
750 INPUT A#
755 IF A#="D" THEN GOTO 585
760 IF A#="H" THEN GOTO 550
765 IF A#="B" THEN GOTO 615
770 IF A#="C" THEN COPY
775 IF A#="S" THEN STOP
780 GOTO 745
900 SAVE "D TO B TO "
901 GOTO 500
SYNTACTIC SUM: 60642, 8K ROM

```

HARDWARE REVIEW

Product: Zebra Light Pen
From: Zebra Systems
 78-06 Jamaica Ave.
 Woodhaven, NY 11421
 212/296-2385
Price: \$24.95 + \$3 P&H

Light pens resemble simple wands you point at your TV display to perform many functions usually invoked with keystrokes. The pens can sense light and dark screen areas and use the brightness it "sees" to help you choose the information or area you want.

Typical light pen uses include menu selection (just point the pen at your choice) and graphics development (tracing complicated line drawings onscreen). Other uses include game playing (selecting objects in an adventure game), and such esoteric attempts as simple photocell operation (sensing light or dark in a room, for example) and measurement functions (sensing intermittent motion).

Zebra's pen consists of a wand about 6" long with photocell assembly. It plugs into a 2"x2" open board containing input jacks for the pen and ZX/TS 9V power supply, output plugs to power your computer and send the pen's signal to the

EAR port, and hardware to condition the pen's output. The hardware includes an LM339 Quad Comparator hooked up in four separate modes: comparator, pulse stretcher, oscillator and output driver. Using a simple LM339 for all these functions deserves mention as an outstanding design achievement.

Documentation seems brief, but complete except for lack of schematics. A cassette with a simple adjustment procedure on one side and a fairly involved "Concentration" game on the other provides you with ready-to-run software and some excellent programming examples. Zebra provides an assembly listing of the light pen's input routine (17 bytes). You must address the pen as port FE (hex) and plug it into the EAR jack after you LOAD your user program. The computer actually reads only one bit.

I set up my pen without difficulty and found it worked adequately, though slowly for choosing squares in the Concentration game and for menu selection. You must place the pen tip flat against the screen to get a reliable read.

Complaints: The computer's 9V power feeds through the unit--a problem with homemade keyboards with certain types of internal power supplies. You must disconnect the plug you used to LOAD the program and plug the pen output into your EAR jack--an inconvenience. My adjustment program contained a minor mistake.

Despite these flaws, Zebra's light pen presents a reasonable buy, especially if you need a moderately reliable light pen or just want to experiment. With large enough blinking blocks, the physically handicapped could use this pen. People unfamiliar with computer keyboards could also use it for applications programs. With its low resolution, I see no valid graphics development for the Zebra.

Paul Donnelly, Centerport, NY

BUYING BY MAIL--KNOW YOUR RIGHTS

ZX/TS consumers can purchase many items through the mail. Mail order shopping can conveniently save you time and effort. But how can you know if you will ever receive the items you order? Take the first step--knowing your rights --to avoid victimization by unscrupulous vendors.

Federal Trade Commission rules give you some rights when you order by mail. The FTC adopted the Mail Order Rule in October, 1975. This rule states:

- * You must receive the merchandise when the seller says you will.
- * The seller must ship the merchandise to you no later than 30 days after your order arrives if the seller states no specific delivery time.
- * If you don't receive it shortly after 30 days, you can cancel your order and get your money back.

Sellers must notify you if a "first delay" situation exists; i.e., when the seller cannot meet the promised delivery date (or the 30-day limit). The seller must also notify you of the new shipping date and give you the option to either cancel the order and receive a full refund, or agree to the new shipping date. The seller must also give you a free way to return your answer, such as a stamped envelope or postage-paid post card. CAUTION!!!...if you don't answer, it means that you agree to accept the shipping delay.

When you cancel a prepaid order, (unless you paid using your credit card), the seller must mail you a refund within seven business days. For any additional delays, the company must obtain your express consent. If you cancel a mail order charged on your credit card, the seller must credit your account within one billing cycle after receipt of your request. This mail order rule does not apply to certain purchases such as: mail

order photo finishing, orders for seeds and plants, magazine subscriptions and other deliveries in a series (except for the initial shipment), COD orders and credit orders when you do not charge before the company mails the merchandise. Also, the rule does not generally apply if you order an item by phone, perhaps using a seller's "800" toll-free number.

If you experience a problem with a mail order purchase, first contact the mail order company. Provide your account number, order number, the exact name or initials you used when ordering, check numbers, order date, etc. The more you provide (and keep track of from the start), the better your chances for resolution of your problem, especially when dealing with small companies that may lack organized record-keeping systems. If you do not obtain satisfaction from the company, contact the following organizations for assistance. Keep copies of all communications.

- * Your local or state consumer protection office or Better Business Bureau.
- * The consumer protection agency nearest to the company.
- * Your local postmaster. Ask for the name and address of the appropriate postal inspector in charge.
- * The book, magazine or newspaper publisher that carried the advertisement. Publishers often try to resolve problems between readers and advertisers. (SYNTAX's Vendor Report develops mostly from reader-supplied information.--LFV)
- * The Direct Mail/Marketing Association, Mail Order Action Line, 6 E. 43rd St., New York, NY 10017.
- * The Federal Trade Commission 6th St. & Pennsylvania Ave., Washington, DC 20580.

Although the FTC can't resolve individual disputes, your information may help reveal patterns of practices requiring FTC action.

Victor Font, Jr., Jersey City, NJ

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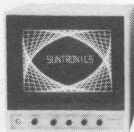
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WE-THEY SCOREPAD--8K/16K

WE-THEY keeps score for two-person or two-team games.

To use WE-THEY, enter the program as shown and save by RUN 620. Enter the name of the game, winning score, whether the total of each WE-THEY entry must equal a predetermined value, and verify the information offered. The scorepad appears on the screen, displaying the game name, winning score and a prompting box. Under the headings WE and THEY you see the last score input and the totals.

First input the score for WE, then THEY. The prompting box waits for the next entries at game's end. When someone wins, the scorepad scrolls offscreen and the winning score appears. To score a new game, just press ENTER.

If no one wins after 13 score entries, the scorepad scrolls offscreen and reappears with the current scores and totals listed again. This ensures the prompt box, which scrolls with the scoring, remains onscreen.

Variables:

WT--scoring total for WE

TW--scoring total for THEY

J--controls print position for prompting box

C--if C=0, the total of WE and THEY entries need not equal a predetermined value; if C=9, the total must meet predetermined value (line 298)

SC--winning score

U--if U=0 then score applies to WE. If U=1, score applies to THEY (lines 412, 414)

T--if T<>0, it represents the total of WE and THEY. Under this condition, only scores whose total equals the predetermined value T are valid

K--counts number of scoring lines displayed on screen. When K=13, scorepad is redrawn and K set to zero (lines 130, 133)

Line Functions:

100-109 draw scorepad format on screen

111-128 accept input scores
130-135 redraw display if K=13
295-315 check whether WE plus THEY must equal a predetermined value, calculate totals, list scores and totals on scorepad
400-414 check for unacceptable entries (characters other than 0-9)
500-542 obtain information at start of program on nature of game to score
550-575 display end of game info
600-615 accept answers to YES and NO questions at start of game
700-705 are a delay routine

Harold Hart, James Park, NB, Canada

```
1 REM "WE-THEY"
2 LET J=4
3 LET C=0
4 LET T=0
5 LET A$=""
6 LET B$=""
7 LET U$="0"
8 LET S$="0"
9 LET WT=0
10 LET TW=0
11 LET T#="0"
12 LET J#="0"
13 GOTO 500
14 FOR N=1 TO 13
15 SCROLL
16 NEXT N
17 PRINT AT 16,2:"** ";SC;"*
18 AT 17,22:"";TAB 0;A
19 TAB 22;" SCORE ";TAB 11-INT
20 (.5*LEN N$);N$;TAB 22;"
21 TAB 0;B$;TAB 22;"
22 TAB 22;"
23 LET K=0
24 SCROLL
25 PRINT TAB 8;"WE";TAB 14;"THEY"
26 SCROLL
27 PRINT "
28 SCROLL
29 PRINT TAB 11;"
30 SCROLL
31 GOSUB 310
32 LET J=J+1
33 LET U=0
34 PRINT AT 20-J,27;" ";AT
35 20-J,25;"WE ??";AT 20-(J-1),27;"
36 INPUT D$
37 GOSUB 400
38 PRINT AT 20-J,27;" ";AT
39 20-J,31-LEN D$;D$
40 LET U=D$
41 PRINT AT 20-(J-1),27;" "
42 AT 20-(J-1),23;"THEY ??"
43 LET U=1
44 INPUT D$
45 GOSUB 400
```



```

125 PRINT AT 20-(J-1),27;" "
:AT 20-(J-1),31-LEN D#;D#
126 LET T#=D#
128 GOSUB 295
130 IF K=13 THEN LET J=4
133 IF K=13 THEN GOTO 90
135 GOTO 111
295 LET TT=VAL W#+VAL T#
296 IF TT<0 THEN LET TT=ABS TT
298 IF C=9 AND T<>TT THEN GOTO
113
300 SCROLL
302 LET UT=UT+VAL W#
303 LET S#=STR# UT
304 LET TW=TW+VAL T#
305 LET J#=STR# TW
310 PRINT AT 21,4-LEN W#;W#;;TA
B 10-LEN S#;S#;TAB 11;"#";TAB 17
-LEN J#;J#;TAB 23-LEN T#;T#
312 LET K=K+1
313 IF S#=J# THEN GOTO 315
314 IF VAL S#>=5C OR VAL J#>=5C
THEN GOTO 550
315 RETURN
400 IF D#="" AND U=0 THEN GOTO
113
402 IF D#="" AND U=1 THEN GOTO
122
404 FOR A=1 TO LEN D#
406 IF D#(A)=CHR# 22 THEN NEXT
A
408 IF D#(A)<CHR# 28 OR D#(A)>
CHR# 37 THEN GOTO 412
410 NEXT A
411 RETURN
412 IF U=0 THEN GOTO 113
414 IF U=1 THEN GOTO 122
500 PRINT AT 2,0;A#;TAB 4;"WE-T
HEY SCOREPAD";TAB 0;B#
502 PRINT AT 5,0;"NAME OF GAME
???"
504 INPUT M#
505 LET N#=M#
506 IF LEN M#>18 THEN LET N#=M#
(1 TO 18)
507 PRINT AT 7,12;N#
508 PRINT AT 9,0;"WINNING SCORE
???"
510 INPUT SC
512 PRINT AT 10,20;SC
514 PRINT AT 12,0;"DOES THE TOT
AL OF EACH ""WE-THEY"";TAB 0;"I
NPUT HAVE TO EQUAL";TAB 0;"A SET
VALUE ?"
516 GOSUB 600
518 IF E#="Y" THEN GOTO 522
520 GOTO 528
522 PRINT AT 16,0;"ENTER VALUE.
"
523 LET C=9
524 INPUT T
526 PRINT AT 17,20;T
528 PRINT AT 19,0;"SATISFIED ?"
530 GOSUB 600
538 CLS
540 IF E#="N" THEN GOTO 500
542 GOTO 100
550 GOSUB 700
556 PRINT AT 5,0;N#;TAB 0;A#(1
TO 18);AT 9,0;A#;TAB 0;"GAME FIN
ISHED...";TAB 0;B#;TAB 6;"#";TA
B 6;"#";TAB 10;"WE - ";S#;TAB 6;
"#";TAB 6;"#";TAB 8;"THEY - ";J#
558 PRINT AT 20,0;"HIT ENTER FO
R A NEW GAME..."

```

```

560 INPUT E#
561 LET W#="0"
562 LET T#="0"
563 LET S#="0"
564 LET J#="0"
565 LET J=4
566 LET UT=0
568 LET TW=0
570 GOSUB 700
575 GOTO 100
600 PRINT TAB 20;"(Y-OR-N) ???"
602 IF INKEY#="Y" OR INKEY#="N"
THEN GOTO 605
603 GOTO 602
605 LET E#=INKEY#
606 POKE 16442,PEEK 16442+1
608 PRINT TAB 20;" ";E#)
610 FOR N=1 TO 20
612 NEXT N
615 RETURN
620 SAVE "SCORE#"
625 GOTO 2
700 FOR N=0 TO 21
702 SCROLL
703 NEXT N
705 RETURN
SYNTACTIC SUM: 29955, 8K ROM

```

RETRACE YOUR STEPS--8K

This program lets you draw on your screen using arrow keys and stores your drawing in an array. Type in the listing, then RUN in SLOW. Use the arrow keys to move the square in the lower left corner, leaving a line behind.

When you finish, press R. The computer clears the screen and retraces your steps, then stops. You can quit early by pressing BREAK.

David Margrave, Missoula, MT

```

10 CLS
20 DIM X(1000)
30 DIM Y(1000)
40 FOR Z=1 TO 1000
50 IF INKEY#="5" THEN LET X(Z)
=X(Z)-1
60 IF INKEY#="8" THEN LET X(Z)
=X(Z)+1
70 IF INKEY#="6" THEN LET Y(Z)
=Y(Z)-1
80 IF INKEY#="7" THEN LET Y(Z)
=Y(Z)+1
90 PLOT X(Z),Y(Z)
100 IF INKEY#="R" THEN GOSUB 50
00
110 LET X(Z+1)=X(Z)
120 LET Y(Z+1)=Y(Z)
130 NEXT Z
5000 CLS
5010 FOR Z=1 TO 1000
5020 PLOT X(Z),Y(Z)
5030 NEXT Z
5040 STOP
SYNTACTIC SUM: 20083, 8K ROM

```

FASTER PSEUDORANDOM NUMBERS

I find the RND function rather slow, especially troublesome when used in realtime graphics games. You can sequentially PEEK from the 8K ROM's machine language operating system (essentially a pseudorandom number table) from a randomly selected starting point to provide "random" numbers. This method works demonstrably faster than using RND. RUN the following short program in SLOW to randomly place an inverse space in each of the first 22 screen rows.

```
1 FOR I=0 TO 21
2 PRINT TAB 32*AND; "█"
3 NEXT I
```

Execution time: 4.6 seconds.
Now try this, also in SLOW:

```
1 LET P=RND*1000
2 FOR I=0 TO 21
3 PRINT TAB PEEK (P+I)/8; "█"
4 NEXT I
```

These lines produce the same display in 3.5 seconds. Line 1 sets P equal to a number between 0 and 999. Line 3 PEEKs the address formed by adding the loop counter I to P. Address P+I always holds a number between 0 and 255, so division by 8 gives pseudorandom numbers between 0 and 31. Generate numbers in any range by picking the proper division and/or algebraically manipulating PEEK (P+I). This technique usually runs about 25% faster than using RND repeatedly.

RACER, following, runs in 2K if you add the following lines to initially fill the display file. (It won't fit in 1K.) Larger memories do not need these lines.

```
22 FOR S=0 TO 21
24 PRINT TAB 31; "█"
26 NEXT S
```

Note lines 40, 90 and 100 work to produce the "winding" of the road. Use this technique to speed up any program using RND. Steer the star down the road using keys Y and 8.

Dan Tandberg, M.D., Albuquerque, NM

```
10 REM "RACER"
20 REM USE "Y" AND "8" TO STEER
R
30 LET S=0
40 LET R=RND*1000
50 LET G=15
60 LET A=15
70 SCROLL
80 LET XA=A
90 LET N=PEEK (R+S)/255
100 LET G=G+(N>.5 AND G<22)-(N<.5 AND G>0)
110 LET K#=INKEY#
120 LET A=A+(K#="8")-(K#="Y")
130 PRINT AT 21,31;AT 21,G;"█"
140 IF PEEK (PEEK 16398+256*PEEK
K 16399)(<>0 THEN GOTO 180
150 PRINT AT 10,XA;" " AT 11,A)
160 LET S=S+1
170 GOTO 70
180 PRINT S
190 PAUSE 1E4
200 CLS
210 RUN
SYNTACTIC SUM: 27854, 8K ROM
```

STOP AUTO-RUN

Use this program to stop an auto-RUN program (a program that automatically RUNs when LOAded) before it RUNs.

Type in this program and SAVE it, because your auto-RUN program wipes it out. With this program in your computer, put the auto-RUN tape in your tape deck. Hit RUN then ENTER. The screen goes blank for two seconds in FAST, eleven in SLOW. When a flickering diagonal pattern appears on your screen (indicating LOADING), press PLAY on your recorder. When your auto-RUN program has LOAded, a STOP report code (9/line number) appears in the bottom left of your screen. Now hit LIST to see your program.

Lloyd Painter, Quakertown, PA

```
5 REM STOP AUTO-RUN
10 LET U$="042.020.054.054.239
.035.034.022.054.054.011.035.054
.011.035.054.118"
11 LET A=30815
12 FOR N=1 TO 65 STEP 4
13 POKE A,VAL U$(N TO N+2)
14 LET A=A+1
15 NEXT N
20 FOR A=832 TO 935
21 POKE (A+30000),PEEK A
22 NEXT A
30 FOR A=508 TO 518
```

```

31 POKE (A+30000),PEEK A
32 NEXT A
40 POKE 30840,124
45 POKE 30841,120
50 POKE 30871,124
55 POKE 30872,120
60 POKE 30893,124
65 POKE 30894,120
70 POKE 30897,44
75 POKE 30898,119
80 POKE 30519,207
85 POKE 30520,8
90 RAND USR 30815
SYNTACTIC SUM: 34957, 8K ROM

```

TIMEX AT THE HEART OF THE KIDNEY

TS1000s plus peripherals can make life easier and less expensive for artificial kidney patients and US taxpayers.

Artificial kidneys used by dialysis patients cost \$20-50 each and patients can use each only once. Each kidney patient must dialyze, using a new kidney, three times a week. Medicare, through our tax dollars, bears 80% of this cost for 64,000 US artificial kidney patients. At an average of \$30 per dialysis, each patient spends \$72 per month personally, while the government picks up the remainder--hundreds of millions of dollars for treatments each year.

So where does our TS1000 fit in? Medi Products of Salt Lake City built a system to reclean and reesterilize artificial kidneys around a TS1000 with a Votem from Down East Computers, Greenville, NC, and Persona, Periconb and a special keyboard from Sinclair Place, Redmond, WA. The computer completely controls all processes under EPROM software direction.

Now kidney patients can use a single kidney up to six times, cutting their own costs to about \$14 per month and potentially saving Medicare millions.

Medi Products president Dick Fife says they expect FDA approval of the device (priced at \$5000) very soon. For information, contact Dick Fife at Medi Products, 240 West 2950 South, Salt Lake City, UT 84115, 801/487-8244.--ALZ

ZX/TS USERS GROUPS

To find a group in your area, or to list or update your user's group, call or write SYNTAX.

Salt Lake City, UT: R. Vincent Hilton, 838 Emeril Ave., Salt Lake City, UT 84116, 801/537-7149.

Montgomery, IL: Chris Kratsch, 1017 Harmony Dr., Montgomery, IL 60538.

Tacoma, WA: World Wide User Group (Military personnel only), R. Smith, POB 98682. Tacoma, WA 98498-0682.

Hazelwood, MO: McDonnell Douglas Recreational Computer Club, Timex/Sinclair SIG, J.B. Dann, 705 Utz Lane, Hazelwood, MO 63042.

Allendale, SC: Allendale County Computer Users' Group, Gary West, POB 345, Allendale, SC 29810.

Ypsilanti, MI: Add the title TS1000.ZX81 Programmers Club to last month's listing.

Monetevideo, Uruguay: Guillermo Moyna, Mississippi 1634, Apt. 104, Montevideo, Uruguay. Interested in exchanging programs with any ZX/TS programmer.

Dayton, OH: T/S Minds User Group, Steve Douglas, 1515 Canfield Ave., Dayton, OH 45406, 513/278-8163.

Johnson City, NY: Wes Brzozowski, Recording Sec'y, SINCUS, POB 36, Johnson City, NY 13790.

San Antonio, TX: San Antonio Timex/Sinclair User Group, James Houston, 414 W. Elsmere, San Antonio, TX 78212, 512/735-2895.

What's happened to the Nashua Area Radio Club, 11 Briand Dr., Nashua, NH 03063? Please contact SYNTAX if you know this group's status.

DEAR EDITOR:

My Sinclair 16K RAM does not work well with my ZX81; it takes about four on/off warm-ups, only to see black lines moving from bottom to top on my screen.

Yerach Lazarovitz, Brooklyn, NY

Horizontal black bars drifting vertically on the screen result from ripple in the 9V power pack. Your power unit should read 9.75 VDC 650mA on the bottom. Those reading 500 mA are inadequate. If you have the correct model, it may have failed. Try another 9 VDC source good for 650 mA or more.--KO

I found an error in Mastering Machine Code on Your ZX81 by Toni Baker. In Chapter 17, Toni gives an incorrect address for two routines used in floating point arithmetic. She calls them STACKA and STACKBC, used to put numbers on the calculator stack, and gives their respective addresses as 1519 and 151C (hex). Correct addresses: 151D and 1520. The error appears on pp. 159-162.

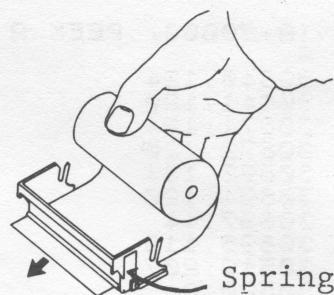
Kevin Bulgrien, Longview, TX

Other errors: on p. 158, 0.325 should read 0.375. On pp. 159-161, change CALL STACKA to CD1D15. Change the top of p. 160 to the following: ADD 1755, SUB 174C, MULT 17C6, DIV 1882. Make corrections in the programs following these items.

Clifford Efaw, Morton, WA

My ZX printer feeds paper incorrectly since I bought it. I corrected the problem after noticing the paper roller springs were too weak. I increased their tension by bending them forward slightly, fixing the problem.

Wayne Johnston, San Francisco, CA



I printed this letter on a BROTHER CE50 typewriter, after composing it with my MEMOTEXT Word Processor. When I tried to buy a CE50 typewriter to use with my ZX81, a mail order house told me they knew of no cable to fit my computer, even with my MEMOPAK Centronics Interface.

After noticing that a CE50 interface included the standard Centronics socket, I knew I could use my interface and cable. As you can see, my system gives me the same capabilities of a much higher priced system. Total cost to me: \$800-900.

My only problem--locating daisy wheels and ribbons.

John K. Mitchell, Westwood, MA

John also sent a copy printed right-justified.--AZ

I typed a program from a booklet, More Software from Softsync, into my TS1000 and it does not run. I tried several fixes and still no run. Please help.

Lenore J. Brown, Euclid, OH

Ken Currier of Softsync says the program, Asteroids in Space, has no bugs. Whenever you enter printed programs, remember to enter keywords as keywords, not spelling them out. Also use 0 (zero) instead of O (the letter) for numbers. Some printed listings fail to slash zeros, making them hard to tell from the letter O.--KO

When I listen to tapes I SAVE on my Panasonic Slim Line recorder (model RQ-2739) I hear loud static noise in the background and in empty areas between recording

starts and 5-second periods before programs. I don't hear it using four C batteries; only with the AC power cord. I can't LOAD programs I SAVED. I can LOAD pre-recorded programs using either power source.

Bob Wildschuetz, Florissant, MO

Though you do not say so, it sounds like you get this problem only with a 16K RAM pack attached. It's the classic RAM noise or hum and should go away if you use a Winky Board. Alternatives include opening the RAM pack and adding filtering to the power lines--the noise originates in the converter and feeds back to the recording output.--KO

Here's a cheap and dirty method to add reset to ZX/TS machines for those who don't want to void their warranty to add peripherals. Take two solid #24 or smaller insulated wires attached to a push button NO switch. Bare about 1/4" of each wire, with the plug facing you. Insert one wire between case and prong 23. Tape it to the case so it's out the way. The other wire sits between the case and prong 4B or 5B.

Clifford Efaw, Morton, WA

My 2K MicroAce with an added 8K ROM and video upgrade kit won't work with my 32K Memopak. When I turn it on, the screen remains blank for about five seconds; then a white line appears down the right side of the screen. I built a regulated power supply, cleaned and tightened the edge connectors, and removed the extra 1K ROM and RAM select ICs to no avail. Help!

Fred Schobert, Du Quoin, IL

MicroAce machines used selected Z80 chips, some of which run at Z80A speeds. Adding more peripherals can stop the Z80. Try changing to a Z80A chip.--KO

I want to adapt my ZX81 RS232 board, printer and disk drive for my 16K Spectrum. Can you help?

John Cipolletti, Southfield, MI

You face two problems: adapting the connector and changing the software or firmware for these accessories. To make the connections, simply wire an adaptor that connects the ZX81-outputs of the Spectrum to appropriate pins and ignore the Spectrum outputs which lack ZX81 counterparts. To correct the software, track down the code changes between ASCII (for Spectrum) and ZX81 codes. Remember that the Z80 codes are identical, but the characters that produce them differ.--KO

I like my TS1000 but not its keyboard. Do you have information about rewiring a standard keyboard to fit the TS key matrix?

Carleton M. Hanson, Oshkosh, WI

SYNTAX published several articles about wiring standard keyboards for ZX/TS computers. See Syntax Quarterly, Winter 82, for a complete explanation, plus info on wiring single-function keys.--KO

What is the difference between a machine code compiler and a machine code assembler?

Ramsay Daly, Seattle, WA

MC compilers turn a BASIC program, or source code, into a machine-code program, or object code. Assemblers translate source code written in machine code mnemonics one-for-one into a machine-code program (object code). In each case the computer executes the object code directly and continuously.

To complete the picture, the ZX/TS BASIC interpreter translates each line of BASIC the computer runs, one at a time, into machine

language, executes that sequence, and returns to examine the next line. Hence we call BASIC an interpreted language.

By compiling programs, you save the machine needing to interpret BASIC lines, thus your program runs faster.--KO

I want to expand my system but not sink a fortune into extra equipment. What system would best speed up load time and provide mass storage? Will equipment and software now available work on new TS computers the same as on my TS1000? In particular, will current software work with a color-producing TS? Finally, has Timex or Sinclair considered using magnetic cards?

Ronald Sherard, Hays, KS

Your choices are fast-loading tapes or disks. Tape systems offer better values although disks run faster. Mindware's system offers the most reliability.

Yes, TS2040 printers work with TS2068s; you don't need memory expansions. Other devices need adaptors. TS1000 software will run on TS1500s, but not on color 2068s.

We presently know of no Timex, Sinclair or third-party plan to use magnetic cards.--KO

VENDOR REPORT AND NOTES

John Oliger still sells boards and parts kits for his SQ articles. Prices remain unchanged except for a four-slot expansion board, \$10 ppd. to replace the more expensive larger board. John Oliger, 10115 Nassau Ln., Indianapolis, IN 46229.

Does your PSION Backgammon cassette needs debugging? Timex is keeping a list of users and expects to send out revised versions after PSION debugs the program. Lauren Esplin, Correspondence Administrator, Timex Computer Corp., Waterbury, CT 06720, 1-800-24-TIMEX.

MACHINE CODE GRAPHICS DEMO

This program provides an unusual display of machine code (MC) graphics. It alters the I register, which contains the high order address of the graphics table. I discovered this trick while trying to develop hi-res graphics for my ZX81. By altering where the computer thinks the graphics table is, the program produces graphics symbols not normally seen by displaying the bit patterns located at the new addresses you set in line 20.

Try different messages in line 50, but don't exceed 31 characters. To hold a screen, press BREAK. To restart, press CONT and ENTER.

DELETE lines 40-70 and add GOTO 1 for a high speed demo.

If you add these lines:

```
90 POKE 16515,30
```

```
100 RAND USR 16514
```

you can change the loop at line 10.

If you stop the program while experimenting, you'll find the program lines are unreadable. To restore to normal display (press ENTER after each):

```
EDIT
```

```
POKE 16515,30
```

```
RAND USR 16514
```

Clem Wehner, Scott AFB, IL

```
1 REM 12345
2 SLOW
3 POKE 16514,62
4 POKE 16515,30
5 POKE 16516,237
6 POKE 16517,71
7 POKE 16518,201
10 FOR I=0 TO 30
20 POKE 16515,I
30 RAND USR 16514
40 FOR J=1 TO 22
50 PRINT "WATCH A VERY BIG DEM
ONSTRATIONX"
60 NEXT J
70 CLS
80 NEXT I
SYNTACTIC SUM: 15005, 8K ROM
```

WHAT DOES THIS PROGRAM DO?

```
10 SLOW
20 FAST
30 GOTO 10
```

Billy Casebeer, Oologah, OK

BOOK REVIEW

Title: An Introduction to VU-CALC Spreadsheets for the Timex/Sinclair 1000 and the Sinclair ZX81
Author: Harry Anbarlian
Publisher: McGraw-Hill Book Co.
1221 Ave. of Americas
New York, NY 10020
Price: \$22.95

"Run-out-and-rip-off-a-user" approaches affect all ZX/TS users, (i.e., taped programs and printed pages sold without regard for quality or utility). One program that does not belong in the "user useless" piles: VU-CALC, a quick, flexible matrix formatting program.

But one new book does belong in the "useless" pile. An Introduction to VU-CALC Spreadsheets offers less actual information on VU-CALC than the fanfold flyer that comes with the program.

This book's cover looks good, (possibly the book's best feature) bearing all the appropriate TMs and circled Rs to lend credibility to its contents. The book offers five "simple" and five "advanced" programs presented in an undecipherable manner.

Of the book's 251 pages, 191 contain the ten exercises presented in this cryptic fashion. The first 50-odd pages discuss various aspects of VU-CALC's use.

It appears the author expects you to know and understand VU-CALC commands (he explains none in the text). But he does not expect you to know how to press appropriate keys (shown in the text by the constant SHIFTS preceding addition signs and use of the letter on each key when describing commands or functions).

This example from page 56 typifies the overall approach: "In addition to the above mentioned commands the Vu-Calc Program has a (D) DELETE FORMULA COMMAND and a (G) GET and (S) SET COMMAND to move

Available from SYNTAX...

For computing beginners —

- Crash Course in Microcomputers \$19.95
Covers hardware, machine language and applications. Reviewed in SYNTAX, Oct. 1981. Add \$1.50 shipping.
- ZX80 Pocket Book \$10.95
Includes ZX81 supplement. Covers Sinclair BASIC, data and program listings. Add \$1.50 postage.

For advanced hardware/software users —

- Zilog's Z80-Z80A CPU
Technical Manual \$7.88
- Zilog's Assembly Language
Programming \$15.75
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Intelligence \$9.95
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a formula to any BOX you desire on the spreadsheet. These commands can be useful for your own individual matrix creations and certainly are well worth exploring, but are not used in any of the matrix Exercises in this book."

These sentences constitute the only mention of these important commands (except in the index). VU-CALC users should know that these time-saving commands allow you to move and alter formulas.

Another example: the only definition of ABSOLUTE AND RELATIVE options (an essential distinction VU-CALC users must make): "You will learn to use both ABSOLUTE (where by using the \$ a variable is kept constant with no change) and RELATIVE options together. Examples of using the ABSOLUTE option can be found in... (three of the exercises). The RELATIVE option is used in all the Exercises."

Gary West, Allendale, SC

SOFTWARE REVIEW

Program: ZX PRO/FILE
 Price: \$16.95 (\$2 off for user groups through Tom if you send name, address of each purchaser)
 ROM/RAM required: 8K/16K minimum
 Printed listings: Yes
 Language: MC, BASIC
 From: Thomas B. Woods
 POB 64
 Jefferson, NH 03583

Byte-Back, ROBOTEC

ZX PRO/FILE uses one of the most sophisticated and efficient data storage and retrieval systems I ever expect to see for the ZX/TS.

This program stores data in files from one or two characters up to twelve 28-character lines. You can chain files to store related data in sequenced files. ZX PRO/FILE does not automatically pre-determine file size, so you can mix files of all sizes with no memory waste. With 16K RAM you can store 10,980 characters.

Tom uses a quick, versatile machine code search routine. You can search files for any "word" up to 28 characters. For instance, you could search your address file for "WOODS", "THOMAS" or "THOMAS B. WOODS." You can search for two words at once, allowing you to find all the people named "WOODS" who live in "NH" or everyone living on "DORCHESTER ST." in "SPRINGFIELD." You can number each file and output in numerical order.

ZX PRO/FILE lets you define print format for hard copy. You can PRINT the entire file, any specified line or block of lines. You can specify the number of blank lines between printed items. Although Woods wrote the program for use with a printer connected with a Memotech Centronics I/F interface, two POKES allow the program to output to Timex and Sinclair printers (explained in the manual).

Join the Click!

NOT JUST A KEYBOARD REPLACEMENT
BUT AN ENHANCEMENT THAT GIVES
KEYBOARD FEATURES FOUND ONLY
ON MORE EXPENSIVE COMPUTERS.

FOR FASTER & EASIER DATA ENTRY WITH YOUR E-Z KEYBOARD...
 Here at last, is a large 60 key TACTILE FEEL keyboard that plugs into the same connectors as the existing keyboard on your ZX81, TIMEX/SINCLAIR 1000 or 1500. **HERE THE CLICK... FEEL THE SNAP!** for every key pressed (tactile feedback)

IT'S THE ONLY KEYBOARD WITH ALL OF THESE FEATURES:

- 60 moving keys, solid (not rubber)
- Legends in three colors on the base (color coded by key function)
- Molded legends on keytops (no stickers)
- 8 automatic shift keys (no shifting required) for edit, delete, single & double quotes, colon, semi-colon, function and stop
- 2 shift keys
- Numeric keypad
- 5 SPACE BAR
- No wiring required (just plug in)

Cables and instructions are included



A custom designed aluminum enclosure (shown above) is available for your E-Z Key keyboard.

Measurements Price
 EC-11 (11" X 9" X 3.5") 24.95
 EC-14 (14" X 9" X 3.5") 29.95

JOYSTICK
 A joystick kit that requires no wiring and functions like the arrow keys and 0 on your computer. Plugs into E-Z Key 60 keyboard.



Measures 10" x 4" x 3"

\$84.95
90 day warranty

SWITCH SPECIFICATIONS
 Precision mechanical 14 by 0.5 spaced and 0.5 intervals between keys. 100,000 operations. Hydraulic force return. Three sources. Dome switch. Push on top with anti-glare extended travel.

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Qty	Item	Unit Cost	Item Total	S & H Unit Cost	S & H Total
	E-Z Key 60	\$84.95		\$3.95	
	EC-11, EC-14	\$24.95, \$29.95		\$4.95	
	Joystick	\$29.95		\$3.95	
		Sub total			
		Mass. residents add 5% sales tax	Grand total		

E-Z KEY

Suite 75 STX
 711 Southern Artery
 Quincy, Massachusetts 02169
 (617) 773-1187

Signature _____
 Name _____
 Address _____
 City _____ State _____ Zip _____

ZX PRO/FILE's 59-page manual provides clear instructions for program use. Other sections discuss tailoring program use to common applications, advanced file manipulation techniques, a summary of available search strategies, a 14-page description of how the program works, and carefully annotated listings of BASIC and MC.

Woods also includes instructions for program mods: compatibility with FASTLOAD, providing a tabulating capability for searches, program adaption for 64K RAM, and permitting files to trigger programmed functions.

Drawbacks: I prefer a program compatible with the TS2040 printer, letting Centronics owners POKE. ZX PRO/FILE could use an alphabetical sorting routine, almost a necessity in most data-handling applications. ZX PRO/FILE's data storage format takes some getting used to.

Joseph A. Grau, Midlothian, VA

INVENTORY--8K/16K

INVENTORY helps you keep track of household or business items.

Load 16K Syntactic Sum then enter INVENTORY as listed. Any keywords in PRINT or REM statements are keywords--do not type them in letter by letter. To type a keyword with the cursor in L (letter) mode, type THEN (shift 3)--the cursor now shows a K. Now press the keyword--it appears on the screen. Move the cursor to the left, between THEN and the keyword. DELETE the word THEN and the keyword remains. INVENTORY uses keywords and tokens to save memory in these lines: 50, 255, 430, 500, 1029, 1245, 2015, 2025, 3015, 3030, 3070, 3200, 4015, 4025, 5015, 5025, 6015, 7000, 7020, 7330, 7500, 8015, 8025, 9000, 9010, 9690.

Spaces and graphics characters form line 9800, the greeting after a successful SAVE or LOAD.

When you get the correct Syntactic Sum, prepare to SAVE INVENTORY to tape. First press CLEAR then ENTER. Next, enter:

```
LET AA=9500
```

Type in:

```
GOTO 9060
```

Start the recorder and press ENTER. The program SAVES, then executes GOTO AA (9500), which assigns the variables and expands the DIMensioned arrays to full size. In the process, the computer reassigns AA to 9800, bringing up the INVENTORY graphic greeting when you SAVE or LOAD the program in the future.

You see a graphic greeting and a prompt to ENTER "M" FOR MENU. Press M to bring up the Menu. Select any menu option by pressing the corresponding key. If you make a mistake and the program stops with an error code, enter GOTO 100. **Do not RUN this program** or you will lose all variables and your data! To start over again, enter CLEAR, then GOTO 9500.

Follow the prompts to explore INVENTORY. When you add items

(option 1), INVENTORY allows these inputs: catalog number, 8 alphanumeric characters; description, 15 characters; source, 2 alphanumeric; cost each 6 digits (decimal point counts as one digit); on hand, 3 digits; on order, 3 digits; reorder, 2 digits. The last five fields must contain numeric data for the program to work correctly.

When you select option 2, the program asks for the catalog number of the item to DELETE. Enter it with or without the leading zeros. If the computer can match this number with a previously entered item, it displays the information on the screen with a prompt to ENTER "D" TO DELETE.

If you press D, the program deletes the inventory item. If you decide not to delete the item, just press ENTER and the item remains.

To change an item's quantity on hand, enter the catalog number, then the amount sold or used. If that amount exceeds the amount on hand, the program tells you it cannot complete the transaction. If your stock covers the sale, the program automatically brings the total up to date and displays it with the new amount on hand.

In response to the TIME TO REORDER prompt, or when ordering to replenish existing stock, enter the item's catalog number. After entering the amount ordered, you see the ONORDER field updated.

When an order comes in, enter the catalog number, then quantity received. The program reduces the ONORDER amount and updates the ONHAND and TOTAL for that item.

To VIEW an item in the inventory (option 6), enter the catalog number. If the computer can't find it, it displays RECORD NOT FOUND and you may return to the Menu.

This program can LIST all items held on file in order by catalog number. Press 7 from the Menu for LIST mode. For hard copy, press Y, otherwise press N in answer to the prompt. If you choose

hard copy, the printer runs until the computer finds the last catalog number and sends all its data to the printer. If you choose N, the information appears on your screen; press C to go to the next record.

Now press S to see the SUMMARY. You see a list of the total number of records on file, the total quantity of all items ON HAND, and the total value (total amount held) of your inventory, with the program name and last update. If you want hard copy, press Z and the computer COPYs the SUMMARY to your printer.

Option 8 revises a record. Enter the catalog number. The item appears onscreen, with a cursor after the CATALOG NUMBER field. To change any data, just type the new one and press ENTER. If you press ENTER without typing new data, the old data remains and the cursor moves to the next line. If you change the ON HAND or COST EACH field, the TOTAL also changes.

REVISE also lets you recycle space used by a DELETED item. Enter *DELETED to bring up the first available deleted catalog number. Input the changes in REVISE mode.

To SAVE, choose option 9 and enter the date you want displayed at the top of the Menu (up to eight characters). The computer SAVES the contents of INVENTORY to tape. When the SAVE completes, you see the first INVENTORY message again.

Brett McCarron, Olympia, WA

INVENTORY comes on tape with full documentation for \$10 from Medicine Creek Productions, P. O. Box 1184, Olympia, WA 98507. For a list of line and variable functions and tips on modifying INVENTORY, send an SASE to SYNTAX.--AZ

```

1 REM ***INVENTORY****
3 REM ***(C) 1983 ****
5 REM *BRETT MCCARRON*
50 REM **USE " GOTO I" TO
    RETURN TO MENU**

```

```

60 REM **DO NOT RUN OR DATA
    WILL BE LOST**
100 GOSUB 250
210 PAUSE P
220 LET S$=INKEY#
230 IF CODE S#<29 OR CODE S#>37
    THEN GOTO 210
240 GOTO VAL S#*1000
250 CLS
255 PRINT AT 11,U;" (1) ADD ITE
M";" (2) DELETE ITEM";" (3) FIL
L ORDER";" (4) ORDER STOCK";" (
5) RECEIVE STOCK";" (6) VIEW ITE
M";" (7) LIST ";" (8) REVISE";
" (9) SAVE "
260 PRINT AT Z,U;">PLEASE INPUT
FUNCTION"
265 PRINT AT U,U;"
"
270 FOR C=11 TO 19
275 PRINT AT C,U;" ";AT C,N;" "
280 NEXT C
290 IF X#="M" THEN GOTO 310
300 CLS
310 PRINT AT L,U;" CAT. NO.:";
DESCRPT:"; SOURCE ;" COST
EA;" ON HAND:"; TOTAL ;"
" ONORDER:"; REORDER:"
315 PRINT AT K,U;"
"
320 PRINT AT Y,U;"
"
325 FOR C=L TO 0
330 PRINT AT C,U;" ";AT C,N;" "
335 NEXT C
340 PRINT AT W,U;"INVENTORY",TA
B 23;U$
345 RETURN
350 FOR C=L TO 0
355 PRINT AT C,Y;"
"
360 NEXT C
365 RETURN
400 INPUT Q$
405 IF Q#="" OR LEN Q#>E THEN G
OTO 400
410 LET I#="0000000"( TO E-LEN
Q#)+Q$
415 FOR A=K TO X
420 IF I#=C$(A) THEN GOTO 450
425 NEXT A
430 PRINT AT 3,Y;">RECORD NOT F
OUND"
445 GOTO I
450 GOSUB S
470 GOTO 25+VAL S#*1000
500 PRINT AT Z,U;"> INPUT ""M""
FOR MENU
505 PAUSE P
510 LET X#=INKEY#
520 IF X#="Z" THEN COPY
530 IF X#="M" THEN GOTO 100
540 GOTO 505
550 LET T$(A)=STR$ (VAL E$(A)*U
AL H$(A))
610 LET C=C+K
620 IF C>L THEN PRINT AT C-K,0;
"
630 IF C<Y THEN PRINT AT C,0;">
"
700 IF S#="7" THEN LET A=T
710 PRINT AT L,Y;C$(A);TAB Y;D$
(A);TAB Y;V$(A);TAB Y;E$(A);TAB
Y;H$(A);TAB Y;T$(A);TAB Y;O$(A);
TAB Y;R$(A)

```

```

310 IF S#="7" AND P#="Y" THEN L
PRINT "
CAT. NO: ";C#(T);TAB N;
DESCRPT: ";D#(T);TAB N;" SOUR
CE: ";U#(T);TAB N;" COST EA: "
;E#(T);TAB N;" ON HAND: ";H#(T)
;TAB N;" TOTAL: ";T#(T);TAB N
;" ONORDER: ";O#(T);TAB N;" RE
ORDER: ";R#(T);TAB N;"
850 RETURN
1000 REM **ADD**
1010 GOSUB G
1015 LET X=X+K
1020 IF X>V THEN GOTO 1700
1025 LET A=X
1027 LET C=K
1029 PRINT AT Z,W;">PLEASE INPUT
DATA"
1030 GOSUB D
1035 INPUT Q#
1040 IF Q#="" OR LEN Q#>E THEN G
OTO 1035
1045 LET C#(A)="0000000"( TO E-L
EN Q#)+Q#
1050 GOSUB D
1070 INPUT D#(A)
1080 IF D#(A)="
THEN GOTO 1070
1090 GOSUB D
1100 INPUT U#(A)
1110 IF U#(A)="
THEN GOTO 110
0
1120 GOSUB D
1130 INPUT E#(A)
1140 IF E#(A)="
THEN GOTO
1130
1150 GOSUB D
1155 INPUT H#(A)
1160 IF H#(A)="
THEN GOTO 11
55
1170 GOSUB 550
1190 GOSUB D
1195 INPUT O#(A)
1200 IF O#(A)="
THEN GOTO 11
55
1210 GOSUB D
1220 INPUT R#(A)
1230 IF R#(A)="
THEN GOTO 122
0
1240 PRINT AT C,0;" ";R#(A)
1245 IF VAL R#(A)>=VAL O#(A)+VAL
H#(A) THEN PRINT AT U,W;">TIME
TO REORDER STOCK"
1500 PRINT AT Z,W;">ANY MORE? (Y
/N)
1510 PAUSE P
1520 LET X#=INKEY#
1530 IF X#="Y" THEN GOTO 1500
1540 IF X#="Z" THEN COPY
1550 LET X#="M"
1560 GOTO 100
1600 GOSUB 350
1610 GOTO VAL S#*1000
1700 PRINT AT 3,Y;">MEMORY FULL"
1710 GOTO I
2000 REM **DELETE**
2010 GOSUB G
2015 PRINT AT Z,W;"> INPUT CAT.
NO. TO DELETE"
2020 GOTO J
2025 PRINT AT Z,W;"> INPUT ""D""
TO DELETE
2040 INPUT I#
2050 IF I#<>"D" THEN GOTO 100

```

```

2060 LET C#(A)="*DELETED"
2062 LET D#(A)="
2064 LET U#(A)="
2066 LET H#(A)=STR# W
2068 LET E#(A)=STR# W
2070 LET T#(A)=STR# W
2072 LET O#(A)=STR# W
2074 LET R#(A)=STR# W
2076 GOSUB S
2080 PRINT AT U,W;">ITEM SUCCESS
FULLY DELETED"
2100 GOTO F
3000 REM **FILL ORDER**
3010 GOSUB G
3015 PRINT AT Z,W;"> INPUT CAT.
NO OF ITEM SOLD"
3020 GOTO J
3030 PRINT AT Z,W;"> INPUT QUANT
ITY SOLD"
3040 INPUT B
3050 IF B>VAL H#(A) THEN GOTO 32
00
3060 LET H#(A)=STR# (VAL H#(A)-B
)
3070 IF VAL H#(A)+VAL O#(A)<=VAL
R#(A) THEN PRINT AT U,W;">TIME
TO REORDER STOCK"
3080 LET T#(A)=STR# (VAL E#(A)*V
AL H#(A))
3090 GOSUB S
3100 GOTO F
3200 PRINT AT U,W;">NOT ENOUGH T
O FILL ORDER"
3210 GOTO F
4000 REM **ORDER STOCK**
4010 GOSUB G
4015 PRINT AT Z,W;"> INPUT CAT.
NO OF ITEM ORDERED"
4020 GOTO J
4025 PRINT AT Z,W;"> INPUT QUANT
ITY ORDERED"
4030 INPUT B
4040 LET O#(A)=STR# (VAL O#(A)+B
)
4050 GOSUB S
4060 GOTO F
5000 REM **RECEIVE STOCK**
5010 GOSUB G
5015 PRINT AT Z,W;"> INPUT CAT.
NO. RECEIVED"
5020 GOTO J
5025 PRINT AT Z,W;"> INPUT QUANT
ITY RECEIVED"
5030 INPUT B
5060 LET O#(A)=STR# (VAL O#(A)-B
)
5065 LET H#(A)=STR# (VAL H#(A)+B
)
5070 LET T#(A)=STR# (VAL E#(A)*V
AL H#(A))
5080 GOSUB S
5090 GOTO F
6000 REM **VIEW**
6010 GOSUB G
6015 PRINT AT Z,W;"> INPUT CAT.
NO. TO VIEW"
6020 GOTO J
6025 GOTO F
7000 REM ** LIST **
7010 CLS
7020 PRINT AT Y,W;"HARD COPY OF
ALPHA LIST ? (Y/N)"
7030 PAUSE P
7040 IF INKEY#<>"N" AND INKEY#<>
"Y" THEN GOTO 7030
7060 LET P#=INKEY#

```

```

7070 GOSUB G
7100 LET B=U
7120 LET T=X
7130 LET M=K
7140 LET B=M+K
7150 IF B>T THEN GOTO 7300
7160 IF C$(B)+D$(B)+E$(B)+H$(B)+
O$(B)+R$(B)+T$(B)+U$(B)>C$(M)+D$(
M)+E$(M)+H$(M)+O$(M)+R$(M)+T$(M
)+U$(M) THEN GOTO 7200
7170 LET M=M+K
7180 GOTO 7140
7200 LET A#=C$(M)
7202 LET J#=D$(M)
7204 LET K#=E$(M)
7206 LET L#=H$(M)
7208 LET M#=O$(M)
7210 LET N#=R$(M)
7212 LET Q#=T$(M)
7214 LET U#=V$(M)
7220 LET C$(M)=C$(B)
7222 LET D$(M)=D$(B)
7224 LET E$(M)=E$(B)
7226 LET H$(M)=H$(B)
7228 LET O$(M)=O$(B)
7230 LET R$(M)=R$(B)
7232 LET T$(M)=T$(B)
7234 LET V$(M)=V$(B)
7240 LET C$(B)=A#
7242 LET D$(B)=J#
7244 LET E$(B)=K#
7246 LET H$(B)=L#
7248 LET O$(B)=M#
7250 LET R$(B)=N#
7252 LET T$(B)=Q#
7254 LET V$(B)=U#
7260 GOTO 7170
7300 GOSUB S
7310 IF P$="Y" THEN GOTO 7370
7330 PRINT AT Z,W;"> INPUT ""C""
TO CONTINUE"
7340 PAUSE P
7350 IF INKEY#("<"C" THEN GOTO 73
40
7370 LET T=T-1
7380 IF T>0 THEN GOTO 7130
7390 LET P$=""
7500 PRINT AT U,W;"> END OF FILE
REACHED","> INPUT ""S"" FOR SU
MMARY DATA"
7510 PAUSE P
7520 LET X#=INKEY#
7530 IF X#("<"S" THEN GOTO 7510
7540 LET H=0
7550 LET T=0
7560 FOR A=K TO X
7570 LET H=H+VAL H$(A)
7580 LET T=T+VAL T$(A)
7590 NEXT A
7600 CLS
7610 PRINT ,,,," CATALOG ITEMS:"
,X,,, " TOTAL ON HAND:";H,,, " TOT
AL VALUE :";T
7635 GOSUB 315
7640 GOTO I
8000 REM **REVISE**
8005 GOSUB G
8010 LET C=K
8015 PRINT AT Z,W;"> INPUT CAT.
NO. TO REVISE"
8020 GOTO J
8025 PRINT AT Z,W;"> INPUT CHANG
E OR PUSH ENTER"
8030 GOSUB D

```

```

8035 INPUT Q#
8040 IF Q#("<" AND LEN Q#<=E THE
N LET C$(A)="0000000"( TO E-LEN
Q#)+Q#
8045 GOSUB D
8050 INPUT Q#
8055 IF Q#("<" THEN LET D$(A)=Q#
8060 GOSUB D
8065 INPUT Q#
8070 IF Q#("<" THEN LET V$(A)=Q#
8075 GOSUB D
8080 INPUT Q#
8085 IF Q#("<" THEN LET E$(A)=Q#
8090 GOSUB D
8095 INPUT Q#
8100 IF Q#("<" THEN LET H$(A)=Q#
8110 GOSUB 550
8120 GOSUB D
8125 INPUT Q#
8130 IF Q#("<" THEN LET O$(A)=Q#
8140 GOSUB D
8150 INPUT Q#
8160 IF Q#("<" THEN LET R$(A)=Q#
8170 GOSUB D
8200 GOTO F
9000 REM ** SAVE **
9005 CLS
9010 PRINT AT Y,U;"> INPUT CURRE
NT DATE", " (MAX. OF 8 CHARACTERS
)"
9020 INPUT U#
9030 IF LEN U#>E THEN GOTO 9010
9060 SAVE "IN"
9070 GOTO AA
9200 STOP
9500 REM **VARIABLES**
9505 FAST
9510 LET D=600
9515 LET E=0
9520 LET F=1500
9530 LET G=3000
9540 LET I=5000
9550 LET J=4000
9560 LET K=1
9570 LET L=0
9580 LET N=31
9590 LET P=32768
9600 LET Q=9
9610 LET S=700
9620 LET U=20
9630 LET V=100
9640 LET W=0
9650 LET X=U
9660 LET Y=10
9670 LET Z=21
9675 LET AA=9800
9680 LET P#=""
9690 LET U#="" NEW DATA"
9700 DIM C$(U,E)
9710 DIM D$(U,15)
9720 DIM E$(U,8)
9730 DIM H$(U,3)
9740 DIM O$(U,3)
9750 DIM R$(U,L)
9760 DIM T$(U,E)
9770 DIM V$(U,L)
9800 PRINT AT S,W;"

```

NTORY INVE
© 1983
WORLD SOFTWARE
9820 GOTO I
SYNTACTIC SUM: 25007, 8K ROM

SOFTWARE REVIEW

Product: ZXMAN
Price: \$14.95 + \$2 C.O.D., \$1.50
P&H if prepaid
ROM/RAM required? 8K/16K
Printed listings? No
Program listable? No
Language: Machine Code
From: Atto-Soft
832 E. Third St.
Galesburg, IL 61401
309/343-4114

Programmers who want to share the profits from that ubiquitous little arcade character who packs away more quarters than ghosts seem everywhere, judging from numerous ads. ZXMAN represents one such programmer's attempt (costing almost 60 quarters).

After you LOAD the tape, this machine-coded game first plays a demo game if you do not take control quickly--a fun-to-watch, informative routine.

ZXMAN presents a fast-moving challenge. "z", "x", "8" and "1" represent ghosts. You can't spot the ghosts as easily on black and white screens as on color, but this simply increases the need for close attention (a clear example of ZX/TS game-playing potential). Our eight-year-old child stopped nagging for a more expensive computer, partially from playing ZXMAN.

ZXMAN's creator designed the program for use with a joystick, like Atari's. (Atto-Soft sells Atari joysticks for \$14.95 + P&H. See SYNTAX Jul.83 p.21 for a SUPER (Atari) JOYSTICK hookup.--LFV). The joystick requires no modification. Installation involves opening your computer and soldering six wires to the keyboard sockets. Atto-Soft provides clear directions and also gives suggestions for other joystick uses. I wired a 14-pin DIP socket in parallel with the keyboard and can unplug the joystick when not using it--useful because the joystick locks out some

shifted commands, such as GRAPHICS. You can play ZXMAN without a joystick using "5" as fire and "1-4" to move the "hero." Of course, using the joystick adds to the fun.

Atto-Soft experienced some distribution problems with early deliveries about six to eight months ago, due to premature advertising. This problem seems solved: My noisy first tape refused to LOAD and Atto-Soft promptly sent a replacement that RUNS and LOADS without a hitch. (Atto-Soft took over the distribution, resulting in problem-free delivery, says Atto-Soft co-owner Keith Ennis.--LFV)

Ronald Miller, Murrysville, PA

LATE NEWS: Laserscan wants to liquidate their limited 16K RAM kit stock--regular \$54.95 now \$16.00+ \$2.95 P&H. Kits contain all parts and instructions except memory chips; you'll need eight 4116-200ns dynamic RAM chips (about \$12.95 for all, says Dennis Hawkins of Laserscan). For info or orders, send an SASE or call Laserscan Electronics Corp, 2305 Broadway, Riviera Beach, FL 33404, 305/842-4255.

ADDRESSING--A BRIEF TUTORIAL

If you find ROM, RAM & PORT addressing and decoding confusing, here's some explanation of what's what. Except in the diagram, here we call control lines by name without distinguishing RD and NOT READ. On the schematic, a line over the name XX means negation NOT XX.

Each address includes a number and several control signals; equal numbers specify separate locations if the control signals differ. Z80 CPUs use a 16-bit address buss--16 wires that can assume 65536 permutations of 0 and 5V--as well as 13 control lines that we can combine. But only MREQ & IORQ are usually used to create different addresses.

Decoding an address means to create circuitry to select a device

based on both numeric and control addresses. Full decoding chooses an exact permutation. Not fully decoded, or partial decoding, means ignore some bits and control lines and respond based on the rest. In either case, the circuit combines address signals to form a few control signals for our device. For example, RAM CS combines MREQ and A14' in a ZX/TS.

All partially decoded schemes respond to many addresses. So if you PEEK 1 or PEEK (1+8192) on your ZX/TS, you get 253 because the ROM isn't fully decoded. You can leave your 16K ZX/TS pack on to try this, but a 64K gives different answers--it's fully decoded.

IORQ & MREQ differentiate port or memory requests of Z80 addresses 0-255. IORQ indicates that the CPU will communicate with the location whose number is on the buss and process the data as to or from a PORT. MREQ tells your decoder the CPU will process the data for this location as though it were to or from MEMORY. See the Zilog CPU Technical Manual for details.

RD and WR separate the Read and Write operations--but you may also use them in the address.

Thus you can read port 254 & have it be the keyboard, a read-only device, and write to port 254 & have it be the display, a write-only device. These expect IORQ to be selected. But ROM location 254 responds to 254 and RD and MREQ. You could then assign a write-only device at 254 and MREQ and WR.--KO

Sinclair computers expect the address lines A0-A7 each to control one device, treated as a port. A device responds when its line (Ax) is 0 during IORQ. Each device reacts to 128 addresses; only one is proper. This specific form of partial decoding is not recognized in the notes by Paul Donnelly and KO in SYNTAX Aug.83. To access one device keep A0-A7 high except for the ONE that selects it.

A	A	A	A	A	A	A	A	A	ADDRESS	PORT	
7	6	5	4	3	2	1	0	HEX	DEC	DEVICE	
1	1	1	1	1	1	1	1	FF	255	DISPLAY	**
1	1	1	1	1	1	1	0	FE	254	KBD, CASS	*
1	1	1	1	1	1	0	1	FD	253	DISPLAY	
1	1	1	1	1	0	1	1	FB	251	PRINTER	
1	1	1	1	0	1	1	1	F7	247	RESERVED	
1	1	1	0	1	1	1	1	EF	239	RESERVED	
1	1	0	1	1	1	1	1	DF	223	RESERVED	
1	0	1	1	1	1	1	1	BF	191	USER ASSIGN	
0	1	1	1	1	1	1	1	7F	127	USER ASSIGN	

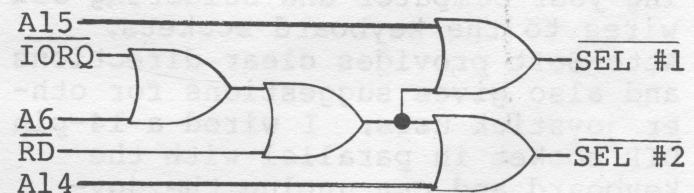
* This port is fully decoded.
 ** Used for speaker and border in the ZX Spectrum.

According to the SPECTRUM manual, bits A6 & A7 are ignored; you can use them. For 512 more addresses, use register indirect addressing of the port. Take any permutation of A8-A15 with either USER ASSIGN I/O address preceding. Use opcodes:

```
LD BC,portaddr ;portaddr=**7FH or
                ;**BFH. 00<**<FF
OUT (C),r      ;write to ** from r
IN r,(C)       ;read from ** to r
```

Or use partial decoding again with A8-A15 to let one gate access both of Paul's devices. Use A14 & A15 as the single low bit to read from two external devices as shown in the sample circuit. One device is port 7FBF & device 2 is at BFBF. Just 3/4 of another chip can decode the write function. I recommend using a 74LS32 Quad OR gate because of its lower power requirement and better availability.

Robert P. La Jeunesse,
 Ann Arbor, MI



Each gate uses 1/4 74LS32

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- What RAM size program requires.
- What ROM program uses.

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